

Message Text

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C O N F I D E N T I A L SECTION 1 OF 3 DHAHRAN 0422

PLEASE PASS AMBASSADOR WEST

E.O. 11652: N/A
TAGS: ENRG, SA
SUBJECT: GAO STUDY OF ARAMCO'S OPERATIONS

1. SUMMARY: CONSULATE HAS RECEIVED COPY OF STUDY ON ARAMCO OPERATIONS DONE BY GAO MEMBER PHILIP WOODSIDE FOLLOWING HIS OCTOBER/NOVEMBER 1977 VISIT TO SAUDI ARABIA INCLUDING FIVE-WEEK FIELD TRIP TO OBSERVE ARAMCO ACTIVITIES IN EASTERN PROVINCE. WOODSIDE STUDY, WHICH IS TO BE PART OF WIDER REPORT ON US-SAUDI ARABIAN RELATIONS, IS COMPREHENSIVE, EXTREMELY DETAILED AND CONTRADICTS RUMORS AND PUBLISHED REPORTS THAT ARAMCO HAS MISMANAGED OIL FIELDS OR NEGLECTED FIELD PRESSURE PROBLEMS. ACCORDING WOODSIDE, ARAMCO EXPERIENCE, TECHNICAL SUPPORT OF PARENT COMPANIES AND REVIEW OF ARAMCO ACTIVITIES BY SAG PETMIN TECHNICAL STAFF "RESULT IN OIL OPERATIONS BEING MANAGED AS WELL OR BETTER THAN ANY OTHER OIL OPERATIONS IN THE WORLD." END SUMMARY

2. PHILIP WOODSIDE, DEPUTY DIRECTOR OF GAO ENERGY DIVISION, WAS PART OF THREE-MAN GAO TEAM WHICH VISITED SAUDI ARABIA IN OCTOBER/NOVEMBER 1977 TO GATHER MATERIAL
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FOR REPORT ON US-SAUDI ARABIAN RELATIONS. WOODSIDE, THE "TECHNOCRAT" OF THE TEAM, SPENT ABOUT FIVE WEEKS IN THE EASTERN PROVINCE INTERVIEWING ARAMCO OFFICIALS, VIEWING VARIOUS ARAMCO INSTALLATIONS, QUESTIONING ARAMCO FIELD OPERATORS, AND TALKING WITH SAG MINISTRY OF PETROLEUM OFFICIALS.

3. WOODSIDE'S REPORT, OF WHICH CONSULATE HAS RECEIVED COPY, IS MOST DETAILED DESCRIPTION OF ARAMCO ACTIVITIES WE HAVE EVER SEEN. ALTHOUGH THERE ARE SOME SLIGHT FACTUAL ERRORS (E.G., NUMBER OF PRODUCING WELLS, WHICH CHANGES FROM MONTH TO MONTH , REPORT APPEARS TO COVER ACCURATELY ALL PHASES OF ARAMCO ACTIVITIES, INCLUDING GAS GATHERING PROJECT.

4. FOLLOWING IS SYNOPSIS OF REPORT:

A. INTRODUCTION

THIS IS GENERAL DESCRIPTION OF ARAMCO OIL FIELDS AND CURRENT PRODUCTION CAPACITY. AS OF JANUARY 1, 1978, ARAMCO, ACCORDING TO WOODSIDE, WAS PRODUCING OIL AND ASSOCIATED GAS FROM 855 WELLS (ACTUAL NUMBER WAS 780) IN 15 OIL WELLS. ABOUT 330 WELLS WERE SHUT IN FOR VARIOUS REASONS, WHICH INCLUDE WORKOVERS AND WELL REPAIRS (ALSO WAITING FOR WATER HANDLING FACILITIES). ABOUT 91 PERCENT OF ARAMCO PRODUCTION COMES FROM FOUR FIELDS: SAFANIYA (15), GHAWAR (59), BERRI (7), AND ABQAIQ (10). ABOUT 70 PERCENT OF SAUDI ARAIAN PRODUCTION PASSES THROUGH ABQAIQ COMPLEX FOR HYDROGEN SULPHIDE REMOVAL, AND OVER 98 PERCENT OF ARABIAN CRUDE AND PRODUCTS LEAVE AT RAS TANURA-JUAYMAH TERMINAL. SAUDI ARABIA'S INSTALLED PRODUCTION CAPACITY AS OF JANUARY 1 WAS SLIGHTLY OVER 12 MILLION BARRELS PER DAY (BPD), WHICH INCLUDES 340,000 BPD IN SAUDI PORTION OF NEETRAL ZONE. (WOODSIDE THEN DISCUSSES
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INSTALLED CAPACITY VERSUS SUSTAINED CAPACITY).

B. GAS GATHERING

PROVED GAS RESERVES ARE APPROXIMATELY 85 TRILLION CUBIC FEET, AND PRODUCTION OF ASSOCIATED GAS IS NOW ABOUT 4.5 CUBIC FEET PER DAY (CF/D). CURRENTLY, ABOUT 20 PERCENT OF THIS LATTER FIGURE IS BEING UTILIZED, EITHER FOR RE-JECTION, LOCALLY AS FUEL, OR AS EXPORT. THERE IS IN PROGRESS A MASSIVE (16 BILLION DOLLAR) GAS UTILIZATION PROJECT, WHICH BY 1985 SHOULD UTILIZE ALL THE APPROXIMATELY 5.5 CF/D BEING PRODUCED. (ARAMCO CAUTIONS THAT CAPITAL EXPENDITURES AND FUTURE PRODUCTION FIGURES ARE ESTIMATES AND FOR PLANNING PURPOSES AND ARE SUBJECT TO PERIODIC REVIEW).

C. RESERVOIR GAS

FOLLOWING A DISCUSSION OF RESERVOR ENGINEERING PRACTICE, WOODSIDE STATES THAT "DURING OUR VISITS TO OIL OPERATIONS IN ARABIA, WE FOUND THAT IN EVERY PRODUCING AREA THE GAS/OIL RATION WAS ALWAYS AROUND 600:1 WHICH DOES NOT INDICATE ABNORMAL RESERVOIR BEHAVIOR, MUCH LESS AN UNCONTROLABLE

GAS GAP.... WE FOUND NO EVIDENCE, NEITHER ABNORMAL
PRESSURE DECLINES NOR ABNORMAL GAS/OIL RATION INCREASES,
TO INDICATE THAT GAS GAP(S) WERE INADVERTENTLY BEING FORMED.
THERE IS NOT NOW ANY UNINTENDED GAS GAP IN ANY PRODUCING AREA
OF THE GHAWAR OIL FIELD THAT CANNOT NOR HAS NOT BEEN CONTAINED."
WOODSIDE CLOSES THIS SECTION BY STATING CATEGORICALLY THAT
ARAMCO'S 40-YEARS OF EXPERIENCE IN SAUDI ARABIA, THE TECHNICAL
SUPPORT OF ARAMCO SHAREHOLDER COMPANIES, AND THE CONSTANT REVIEW
BY THE SAG MINPET TECHNICAL STAFF "RESULT IN OIL OPERATIONS BEING
MANAGED AS WELL OR BETTER THAN ANY OTHER OIL OPERATIONS IN THE
WORLD."

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D. WATER INJECTION

WOODSIDE DISCUSSES NEED FOR WATER INJECTION (CURRENTLY
ABOUT 12.5 MILLION BARRELS PER DAY) FOR PRESSURE MAINTENANCE
IN PRODUCING OIL FIELDS. THEN, HIS SUMMARY AS FOLLOWS: "IN
OUR VISIT TO THE ARABIAN OIL FIELDS, WE COULD FIND NO EVIDENCE
OF ANY PRESSURE DECLINES THROUGH NOVEMBER 1977 AND IN SOME
SEGMENTS OF THE GHAWAR WE OBSERVED SLIGHT PRESSURE RISE.
THIS UPWARD TREND WAS PROBABLY DUE TO WATER INJECTION MORE THAN
COMPENSATING FOR OIL PRODUCTION. BASED ON OUR OBSERVATIONS,
RESERVOIR PRESSURES ARE HOLDING STEADY OR TRENDING SLIGHTLY UPWARD
AS WATER INJECTION BECOMES EFFECTIVE."

E. WATER-PRODUCING OPERATIONS

AFTER A TECHNICAL DISCUSSION OF THE HIGH
SALINITY OF OIL FIELD WATER IN SAUDI ARABIA AND OF WATER

"CONING," WOODSIDE CONCLUDES THAT "WE FOUND NO EVIDENCE THAT ANY WATER-CUT WAS BEING PRODUCED WITH OIL. HOWEVER, THE SALT CONTENT OF THE OIL PRODUCED HAS CAUSED SOME 200 WELLS TO BE TEMPORARILY SHUT-IN. THESE WELLS CAN AND WILL BE WORKED OVER OR OFF-SET IF, AS, AND WHEN ADDITIONAL PRODUCTION IS NEEDED. WE WERE TOLD THAT WHEN THE 47 WELLS TEMPORARILY

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SHUT-IN IN THE NORTHERN AREA OFFSHORE SAFANIYA OIL FIELD WERE RESTORED TO PRODUCTION, AND INCREASE OF 500,000 BPD WOULD RESULT. WATER ENCROACHMENT AND/OR WATER CONING DOES NOT EXIST; EXCESSIVE SALT WITH OIL PRODUCTION IS RECOGNIZED AND IS BEING CORRECTED."

F. EXPLORATION

ARAMCO HAS SIX SEISMIC CREWS OPERATING IN NOVEMBER 1977, AND PETROMIN STARTED A SEISMIC CREW IN OCTOBER IN THE "EMPTY QUARTER." THESE CREWS ARE NOW CONCENTRATING ON SMALLER OIL ENTRAPMENTS SINCE "FOR THE MOST PART, THE TARGET SUBSURFACE 'HIGHS' AND OIL FIELDS CONTAINED THEREIN HAVE ALREADY BEEN FOUND." HOWEVER, "THE PROSPECTS ARE GOOD FOR FINDING OIL IN THESE SMALL HIGHS. WE WERE TOLD THAT THESE SMALL STRUCTURES CAN CONTAIN UP TO SEVERAL HUNDRED MILLION BARRELS OF OIL." THERE FOLLOWS A DESCRIPTION OF THE GEOLOGICAL FORMATIONS IN THE EASTERN PROVINCE.

G. DRILLING ACTIVITY

IN DECEMBER 1977 THERE WERE FOUR LAND RIGS AND ONE MARINE UNIT DRILLING EXPLORATORY WELLS FOR ARAMCO. IN ADDITION, THREE MARINE UNITS AND 12 LAND RIGS WERE ACTIVE IN DELINIATION OF FIELDS. EIGHT LAND RIGS AND THREE MARINE UNITS WERE ALSO CARRYING OUT WELL WORKOVER ACTIVITIES. DRILLING ACTIVITY IN 1977 INCREASED CLOSE TO 25 PERCENT FROM 1976.

H. RESERVES

ACCORDING TO WOODSIDE, OIL AND GAS PROVED RESERVES (AS RELEASED BY THE SAG) AS OF DECEMBER 31, 1977 WERE 150 BILLION BARRELS 85 TCF OF NATURAL GAS. THESE RESERVE FIGURES,

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ACCORDING TO SAG PETMIN, REPRESENT RESERVES RECOVERABLE WITH EXISTING TECHNOLOGY. (ARAMCO IS STILL USING PROVED RESERVES OF 110.187 BILLION BARRELS AND 67.345 BILLION PROBABLE RESERVES

OR 177.532 BILLION BARRELS OF BOTH PROVED AND PROBABLE RESERVES).
WOODSIDE STATES THAT ARAMCO CALCULATES PROVED RESERVES ONLY IN
THAT ARE ACTUALLY DRILLED WHEREIN OIL HAS ACTUALLY BEEN CONFIRMED,
WHEREAS PROBABLE RESERVES ARE CONSIDERED TO BE THAT OIL WHICH
CAN REALISTICALLY BE EXPECTED TO BE FOUND OVER AS YET UNDRILLED
PORTIONS OF THE PRODUCING SUBSURFACE STRUCTURE. "WE WERE TOLD
AND CONFIRMED THAT THERE IS LITTLE DOUBT THAT MOST OF THE OIL
AND GAS NOW CARRIED AS 'PROBABLE' WILL ULTIMATELY BE 'PROVED'
CONSIDERING EXISTING TECHNOLOGY AND ECONOMICS." "IN SUMMARY,"
CONCLUDES WOODSIDE, "THE SLATED OIL AND GAS RESERVES FOR
THE ARAMCO OIL FIELDS ARE REALISTIC AND CAN BE RECOVERED
OVER TIME ALLOWING FOR PRUDENT PRODUCTION PRACTICES SUCH AS
PRESSURE MAINTENANCE AND WORKOVER OPERATIONS AS WELL AS
CONSTANT MONITORING OF THE RESERVOIR BEHAVIOR."

I. PIPELINES/TERMINAL FACILITIES

THIS SECTION IS A COMPLETE DESCRIPTION OF THE
RAS TANURA-JU'AYMAH COMPLEX, WHERE OVER 90 PERCENT OF ARAMCO'S
CRUDE OIL AND ALL OF ITS REFINED PRODUCTS AND NATURAL GAS
LIQUIDS (NGL) ARE LOADED ABOARD TANKERS. TERMINAL OPERATIONS,
TANK FARMS, LOADING SYSTEM, AND PIPELINES ARE DETAILED.

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C O N F I D E N T I A L SECTION 3 OF 3 DHAHRAN 0422/3

J. REFINING

REFINING CAPACITY IN SAUDI ARABIA IS AS FOLLOWS:

COMPANY	THOUSAND BARRELS/DAY
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ARAMCO	415	
GETTY	50	
ARABIAN OIL COMPANY	30	
PETROMIN	48	

WOODSIDE WAS TOLD THAT PETROMIN
WILL ENTER INTO A JOINT VENTURE
WITH CHEVRON AND TEXACO TO BUILD A 5,00,000 B/D REFINERY AT JUBAIL,
AND MODIL HAS A JOINT VENTURE PROPOSAL WITH PETROMEN FOR A
500,000 B/D REFINERY AT YANBU.

K. MAINTENANCE OPERATIONS

MASSIVE CONSTRUCTIONPROGRAMS NOW UNDERWAY. WOODSIDE,
HOWEVER, GIVES HIGH MARKS TO ARAMCO FOR ITS CURRENT MAINTENANCE
OPERATIONS (E.G., "INNOVATIVE AND IMAGINATIVE REPAIR
TECHNIQUES," "NUMEROUS BACK-UP SYSTEMS," "CORROSION
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PREVENTION PROGRAM FOLLOWS OIL INDUSTRY PRACTICES COMMON
THROUGHOUT THE WORLD"). WOODSIDE ALSO DISCUSSED THE MAY
AND JUNE 1977 FIRES AT ABQAIQ WITH ENGINEERS ON SITE. HE
STATES: "WE SAW EXTENSIVE NEW PREVENTIVE-MAINTENANCE AND
SAFETY MEASURES BEING IMPLEMENTED." HE CONCLUDES THIS SECTION
ON MAINTENANCE WITH THE OBSERVATION: "WE FOUND THAT ARAMCO
MAINTENANCE AND SAFETY PROCDURES WEREFUNDAMENTAL TO THEIR
ENTIRE OIL OPERATIONS. THE FACT THAT AN 8.5 MILLION
BPD OPERATION HAS RUN WITH SO FEW MISHAPS IS THE RESULT OF
THIS EMPHASIS ON PREVENTIVE MAINTENANCE AND SAFETY."

L. SUMMARY

A NUMBER OF WOODSIDE'S OBSERVATIONS:

- 1) WITH THE DRILLING OF ADDITIONAL WELLS, THE GHAWAR
FIELD COULD SUSTAIN 9 MILLIN BPD PRODUCTION.
- 2). THE SAFANIYA FIELD COULD READILY HAVE PRODUCTION
INCREASED FROM 900,000 BPD TO 2 MILLION BPD WITH SUFFICIENT
INFRASTRUCTURE IN PLACE.
- 3) "NO TECHNICAL REASONS EXIST, THAT ARE INSURMOUNTABLE,
TO INCRASE OIL PRODUCTION BY AT LEAST 6 TO 7 MILLION BPD BEYOND
CURRENT PRODUCTION LEVELS".
- 4) "AS A RESULT OF OUR FIVE WEEK VISIT OF THE
SAUDI PRODUCING OPERATIONS, WE FOUND NO RECOGNIZABLE
WATER CONING, NO SIGNIFICANT PRESSURE DECLINES... AND

MOST EXPECIALLY NO LARGE OR EXPANDING GAS GAP IN ANY OF
THE FIELDS, AND PARTICULARLY NOT IN THE GHAWAR FIELD.
NOR DID WE OBSERVE ANY MAJOR EQUIPMENT INSTALLATION
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PROBLEMS".

5) IN THE

COMING YEARS THERE WILL BE "TECHNICAL
PROBLEMS" THAT WILL DEVELOP THAT "ARE NORMAL TO VATERING
AND DEPLETING RESERVOIRS." THESE TECHNICAL PROBLEMS WILL
REQUIRE LARGE CAPITAL INVESTMENT FOR: WATER AND GAS INJECTION
FACILITIES, DESALTING EQUIPMENT, GAS GATHERING AND SUPPORT
PROGRAMS.

6) GIVEN THE REMOTE-DESERT ENVIRONMENT OF ARAMCO
FACILITIES, ONE POSSIBLE CONSTRAINT TO INCREASING OIL PRODUCTION
IS THE LOGISTICS OF SUPPORTING THE MANPOWER NECESSARY TO
BRING ABOUT THAT INCREASE.

5. COMMENT: NEW YORK TIMES ARTICLE OF FEBRUARY 8 BY SEYMOUR
HERSH TERMS GAO TECHNICAL STUDY BY WOODSIDE OF ARAMCO OPERATIONS
AS "THE MOST PESSIMISTIC GOVERNMENT REPORT." WE DON'T KNOW
WHAT REPORT MR. HERSH READ (IF ANY), BUT IT CERTAINLY WASN'T
THE 50 PAGE REPORT WE HAVE IN HAND. WOODSIDE REPORT IS WORKMANLIKE
AND COMPREHENSIVE AND GIVES ARAMCO CREDIT (NOT FAULT) FOR
MANAGING OIL FIELDS IN SAUDI ARABIA WITH HIGH DEGREE OF
PROFESSIONALISM AND COMPETENCE. WOODSIDE WAS NOT ABLE TO
FIND THOSE RESERVE "PRESSURE PROBLEMS," PARTICULARLY IN
GHAWAR, THAT HAVE BEEN SUBJECT OF HERSH ARTICLES AND OTHER
AUNORS. IN FACT, WOODSIDE REPORTS THAT PRESSURE IS INCREASING
IN GHAWAR FIELD AND THAT THERE ARE NOT TECHNICAL PROBLEMS
WHICH WOULD IMPAIR CURRENT ARAMCO OIL PRODUCTION OR ARAMCO'S

ABILITY TO INCREASE PRODUCTION SIGNIFICANTLY. WE HOPE
WOODSIDE REPORT RECEIVES WIDE PUBLICITY WHEN PUBLISHED IN ORDER
CORRECT THOSE FALSE RUMORS REGARDING ARAMCO'S MANAGERIAL
CAPABILITY.
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